APHIS Industry Alert

Plant Protection and Quarantine July 2001

Karnal Bunt Discovered in Previously Unregulated Fields

For the first time since 1997, Karnal bunt has been detected in several fields outside of a regulated area. The initial discovery, made in late May 2001 at a grain elevator in Young County, TX, led to a quarantine of the entire county as well as adjacent Throckmorton County. Archer and Baylor Counties, directly north of Young and Throckmorton Counties, were also added to the regulated area after positive seed was found at several local grain elevators. The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) initiated the quarantine in order to contain the spread of the fungus and safeguard the Nation's export wheat industry.

Industry is an important partner in USDA's efforts to protect American agriculture and preserve export markets. Wheat producers, grain handlers, and harvesters throughout the United States need to know how to detect bunted kernels and what to do if they suspect Karnal bunt.

Background

Karnal bunt was first confirmed in the United States in Arizona on March 8, 1996. Soon after that initial discovery, the fungus was also found in parts of Texas and California. APHIS quarantined all infected areas and established a 3-mile regulated area around positive fields.

The disease was first reported in 1931 in wheat-growing areas near the city of Karnal in the Indian State of Haryana. Since then, it has been found in all major wheat-growing States of India, as well as in Pakistan, Iraq, and Afghanistan. The disease may have been present in Mexico since 1970 and has been well established in some areas in northwestern Mexico since 1982.

Federal regulations prohibit the entry into the United States of seeds, plants, unprocessed straw, chaff, and products of the wheat milling process (not including flour) from countries where Karnal bunt is known to occur.

How it Spreads

Karnal bunt is caused by the smut fungus *Tilletia indica* (Mitra) and is spread by spores. Infection occurs during the flowering stage of the host plant. The ideal conditions for infection are cool weather and rainfall or high humidity. Texas experienced unusually wet and cool weather this spring, creating favorable conditions for the development of the fungus.

Karnal bunt is spread primarily through the movement of infected seed. In addition, infectious spores can be carried and deposited on a variety of surfaces—plants and plant parts, seeds, soil, elevators, buildings, farm equipment, tools, and even vehicles. Spores and the sporidia they produce also can be windborne, although the sporidia are fragile and may be able to move only short distances.

Detection

Unlike other plant pests that are easy to identify, Karnal bunt can be hard to detect. Infected wheat does not show any symptoms until it has reached maturity. Even then, the disease cannot be detected in plants growing in the field: the grain must be removed from the head and examined.

Producers, harvesters, and handlers should look for bunted kernels that are fragile, dark in color, and fishy smelling. The kernel usually remains whole, although part of the germ may be eroded. Cracks in the surface will reveal a black powdery spore mass within the endosperm at the embryo end of the kernel or along the kernel groove.

Symptoms of Karnal Bunt *(Tilletia indica)* Infection on Wheat Seed.
1. Healthy wheat seed. 2. “Tip” infection. 3. More advanced tip infection. 4. Advanced infection.
5. “Canoe” symptom hollowing out interior of seed.

What Can Industry Do to Help?

Any kernels that show signs of contamination should be placed in a plastic bag within a sturdy container and taken to the nearest State regulatory official or to an APHIS Plant Protection and Quarantine (PPQ) field office. To locate the closest PPQ field office in your area, please call 1-888-661- 8083.

Producers: If the weather in your area has been rainy and cool, conditions are favorable for the development of the Karnal bunt fungus. Even if you are not in an area regulated for Karnal bunt, please be aware of the symptoms of this disease. If you suspect Karnal bunt, please contact APHIS immediately.

Grain Handlers: APHIS initiated a National Karnal Bunt Survey in 1996 to test wheat at grain elevators throughout the Wheat Belt. In addition to participating in these survey efforts, handlers should pay close attention to all arriving shipments of wheat. If an incoming shipment has a fishy or foul odor, do not mix it with other wheat. Isolate the bin and contact APHIS immediately for testing and analysis.

Harvesters: Combines and other harvesting equipment used to harvest wheat in a regulated area must be issued a Federal certificate before they can be moved to any location outside that regulated area. Before the certificate can be issued, the equipment must be thoroughly cleaned and disinfected to ensure that Karnal bunt is not moved on contaminated equipment. Harvest equipment is usually cleaned by using either a Clorox solution, steam, or hot water and detergent. To determine the required cleaning treatments and to obtain a certificate for movement, contact APHIS.

Additional Information

To learn more about Karnal bunt or to report a suspected outbreak, please contact APHIS’ PPQ office in Riverdale, MD, at 1-888-661-8083. You can also visit our Web site at www.aphis.usda.gov/ppq/emergencyprograms/